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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/690,230	10/20/2003	Scott B. Reeder	STFUP152/S02-130	4946

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EXAMINER

KISH, JAMES M

ART UNIT	PAPER NUMBER
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3737

MAIL DATE	DELIVERY MODE
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08/22/2007

PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary

Application No.

10/690,230

Applicant(s)

REEDER ET AL.

Examiner

James Kish

Art Unit

3737

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 09 March 2007.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-19 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-4 and 14-19 is/are rejected.
- 7) ☒ Claim(s) 5-13 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Response to Arguments

Applicant's arguments filed March 9, 2007 have been fully considered but they are not persuasive.

Applicant argues that Xiang does not use a least square error method. While the embodiment described in depth does not use the least square method, the last sentence of the Abstract clearly states, "... solutions of water and fat with improved signal-to-noise ratio can be obtained by either averaging or a least square error method."

With respect to Applicant's argument that a statistical bias must be used, in the summary of the invention it states, "If a pixel contains only one component, a known statistical bias is applied to identify the component... pixels with only one component are assumed to be... water." Once the water and fat have been properly identified, "the water and fat solutions obtained from the three complex images may be used to directly produce two chemical species, i.e., water and fat images (column 4, lines 1-9)."

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 1-4 and 14-19 are rejected under 35 U.S.C. 103(a) as being unpatentable over Glover et al (US Patent No. 5,225,781) in view of Xiang et al. (US Patent No. 6,091,243). Glover discloses a method of obtaining magnetic resonance (MR) signals with signal separation for at least two chemical species in a heterogeneous magnetic field with steps comprising obtaining first MR signals from pixels in an object having at least two chemical species using first repetition and first echo time and obtaining at least second and third subsequent MR signals from the pixel using second and third echo times. Determining a signal for each pixel by combining all signals for the pixel, calculating a first error to the heterogeneous field, and repeating the steps above until a threshold error is achieved (col. 4, line 34 – col. 5, line 26; col. 8, line 48 – col. 10, line 13; col. 11, line 27 – col. 12, line 61). However, Glover uses a least square fitting method to unwrap the phase and not to differentiate the water from the fat. Xiang teaches a water-fat imaging with direct phase encoding. Three images are acquired and from these the water and fat can be separated. It can be shown that the optimal averaging is actually identical to a water and fat solution obtained from equations (43-45) with a complex valued or real valued least square error (LSE) method, as known in the art (column 16, lines 39-51). Also see column 21, lines 4-20. It would have been obvious to one having ordinary skill in the art at the time the invention was made to use a LSE method to differentiate between water and fat, as taught by Xiang, instead of phase unwrapping because phase unwrapping methods are sensitive to noise and artifacts, heavily rely on the spatial continuity of an image and, thus, often become

inoperable when tissues in the FOV are imaged as disconnected fragments (column 3, lines 40-44).

With respect to claim 4, Glover discloses in equations 17-19 that the MR signals are defined in a real and an imaginary function to represent the spatial and phase information.

With respect to claims 14-16, Glover further discloses that the method includes combining each scan's heterogeneous field and determining weighting contribution or coefficient (col. 13, line 66 – col. 14, line 11).

With respect to claims 17-19, Glover discloses determining the map of the combined field in equations 29 and 30. The equations are in different form analog to digital, otherwise, the map function is identical (col. 13, lines 3 – 31).

Allowable Subject Matter

Claims 5-13 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Conclusion

THIS ACTION IS MADE FINAL. Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within

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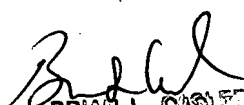
TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to James Kish whose telephone number is 571-272-5554. The examiner can normally be reached on 8:30 - 5:00 ~ Mon. - Fri..

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Brian Casler can be reached on 571-272-4956. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

JMK


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